

## TREBACOSA EUROPAEA, A NEW WOLF SPIDER FROM HUNGARY (ARANEAE, LYCOSIDAE)

Cs. Szinetár and B. Kancsal: Department of Zoology, Berzsenyi College, Károlyi Gáspár tér 4, Szombathely, H-9700 Hungary. E-mail: szcsaba@bdtf.hu

**ABSTRACT.** A new species of Lycosidae, *Trebacosa europaea*, is described from male specimens collected within reed beds of Lake Velencei from Hungary. The species represents the Palearctic sister species of the Nearctic *Trebacosa marxi* (Stone 1890), and occurs in a very specialized habitat of *Phragmites communis*.

**Keywords:** Palearctic sister species, lycosid spider, reed beds, scanning micrographs

During a faunal survey of reed beds within Hungary we found male specimens of a previously unnamed species of lycosid spider on the southern shore of Lake Velencei. The peculiar morphology of the spider suggested that it could not be placed in any genus currently known from Europe or Asia, and we eventually surmised that it belonged within the genus *Trebacosa* Dondale & Redner 1981. Although this genus was previously known from a single named species, *T. marxi* (Stone 1890), which is restricted to North America (Dondale & Redner 1981; Paquin & Dupérré 2003), there have been two recent reports of a species of *Trebacosa* from Europe. Villepoux (1995) reported the capture of a new species of this genus from France, and Zhukovets (2003) found a new species in Belarus. These two conference abstracts did not provide a description of either species. Dondale & Redner (1981) provided a detailed appraisal of the genus, and suggested that *Trebacosa* can be reliably distinguished from the very similar genus *Pirata* Sundevall 1833. The median apophysis of the male palp, which in males of *Pirata* is rather small and pointed, is massive and armed with two large, pointed processes in *Trebacosa* (Dondale & Redner 1981).

Although our reed bed survey only captured male specimens, we have decided to present a species description because we believe that the description will contribute to the knowledge on the species' European distribution and to the eventual discovery and description of female specimens.

### MATERIAL AND METHODS

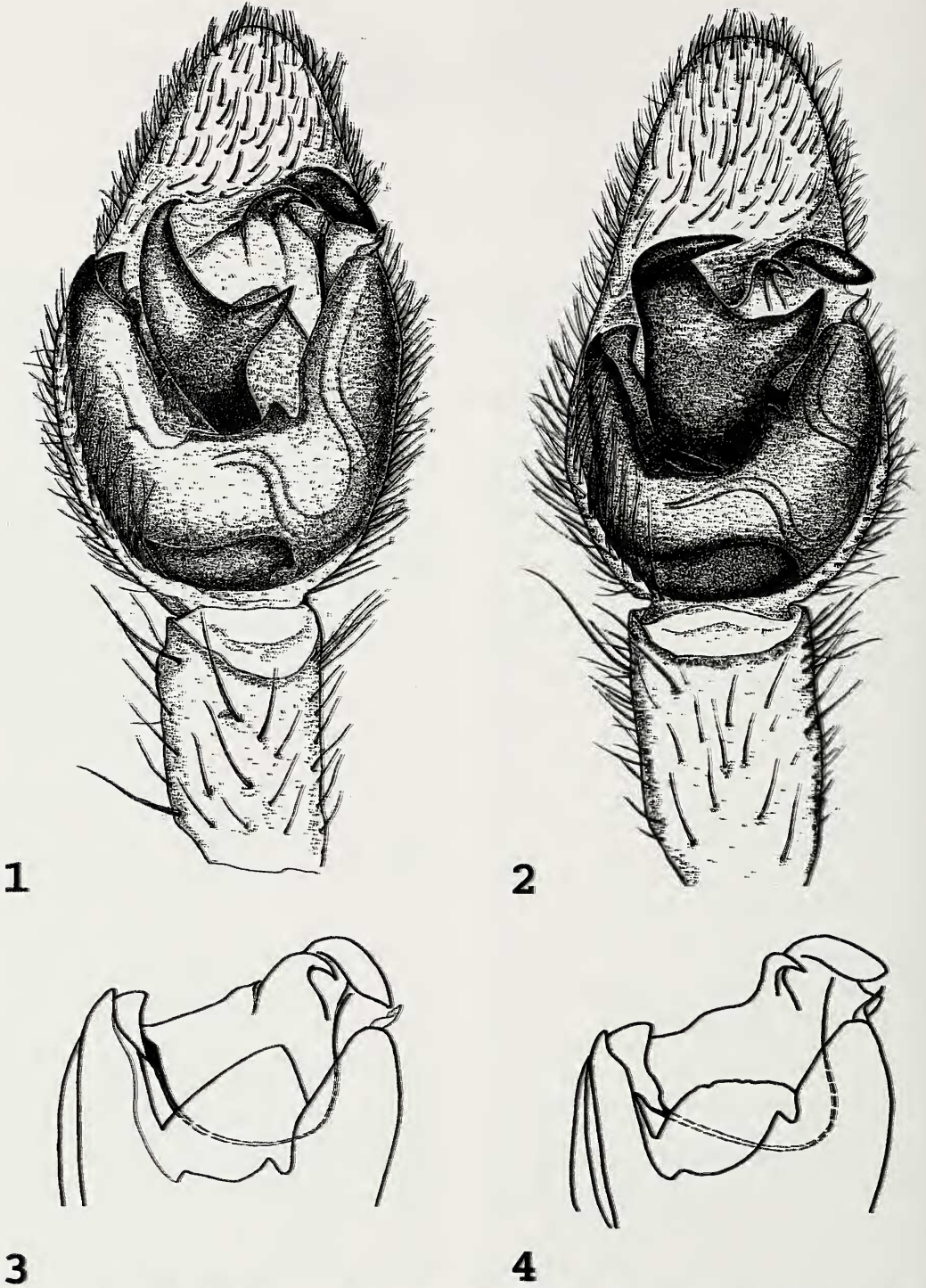
This study is primarily based on Barber pit-fall trappings that were carried out in the reed beds of Lake Velencei between November 2003 and June 2005. Traps consisted of 400 ml, 85 mm double cups, with 70% ethylene glycol used as preservative. We placed 28 traps in 7 rows, with 4 traps in each row amongst the coastline reeds. All specimens are deposited in the Soil Zoological Collection (former Arachnoidea Collection) of the Department of Zoology, Hungarian Natural History Museum (Budapest). The electron micrographs were prepared in the Hungarian Natural History Museum, Budapest (courtesy of Dr. Krisztina Buczkó) with a Hitachi SN 2600 scanning electron microscope. The drawings were made using a Leica MZ6 stereo microscope by Béla Kancsal. The new species was compared with specimens of *Trebacosa marxi*: 1 ♀, 1 ♂, CANADA, Ontario, Oliver Bog June, July 1987, D. Blades (det. J. Redner) (These two specimens are deposited in the collection of the first author (CSz = coll. Szinetár).) The following abbreviations were used in the manuscript: PME = posterior median eyes; AME = anterior median eyes; ALE = anterior lateral eyes. Measurements (mm) are expressed as means  $\pm$  SE.

### TAXONOMY

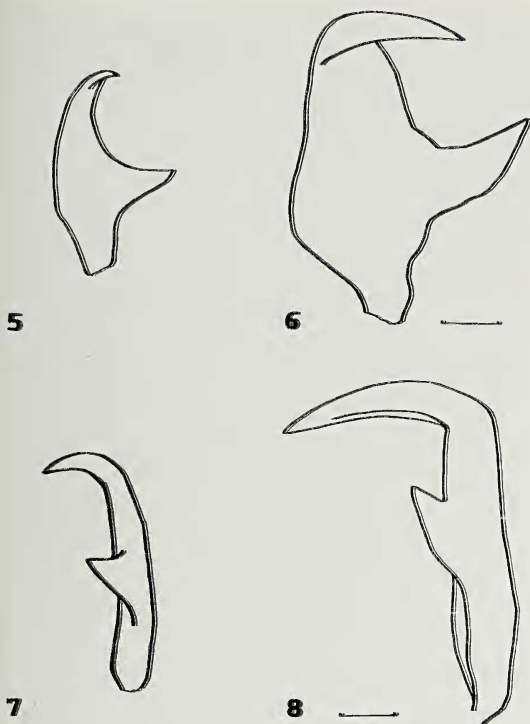
Family Lycosidae Sundevall 1833  
Genus *Trebacosa* Dondale & Redner 1981

**Type species.**—*Pirata marxi* Stone 1890, by original designation.

**Remarks.**—The only named species cur-



Figures 1-4.—Male palp of *Trebacosa* species: 1. Left palp of *T. europaea*, ventral view; 2. Left palp of *T. marxi*, ventral view; 3. Apical division of male genital bulb of *T. europaea*, ventral view; 4. Apical division of male genital bulb of *T. marxi*, ventral view.



Figures 5–8.—Median apophysis of the male palp of *Trebacosa* species: 5. *Trebacosa europaea*, ventral view; 6. *T. marxii*, ventral view; 7. *T. europaea*, lateral view; 8. *T. marxii*, lateral view. Scale line = 1 mm.

rently included in *Trebacosa* is *T. marxii* from North America (Dondale & Redner 1981; Paquin & Dupérré 2003). The discovery of European species of *Trebacosa* (Villepoux 1995; Zhukovets 2003) expands the geographic distribution of the genus, and the description of a new species from Hungary presented here is only the second species of *Trebacosa* to be named.

#### *Trebacosa europaea* new species

Figs. 1, 3, 5, 7, 9, 11, 13

**Material examined.**—Holotype male: HUNGARY: *Mezőföld*: Lake Velencei Basin, István Chernel Bird Observatory (47°11'N, 18°36'E), Barber pitfall trap, 30 June 2004, Cs. Szinetár & B. Kancsal (HNHMB). Paratypes: 4 males, same location and collectors, 30 June 2004 (HNHMB); 10 males, same location and collectors, 25 July 2004 (HNHMB); 1 male, same location and collectors, 3 June 2005 (HNHMB).

**Etymology.**—The species name refers to

the currently known distribution of the species.

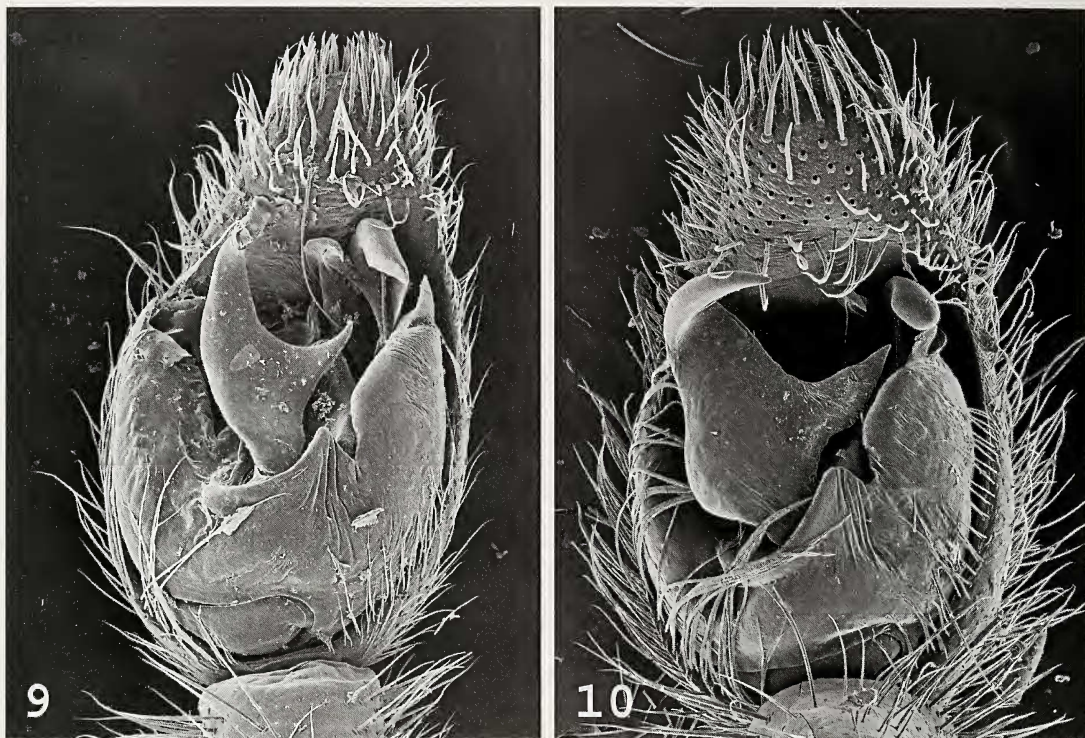
**Diagnosis.**—*Trebacosa europaea* can be distinguished from *T. marxii* as follows: the median apophysis (Figs. 5–8) is 1.2 times longer than broad in *T. marxii* and 1.7 times longer than broad in *T. europaea*, and the lower process of the median apophysis is similar to that in *T. marxii* but the upper process is shorter and more pointed. The upper branch of the terminal apophysis is clearly reflexed ventrally, while in *T. marxii* it is bluntly rounded (Figs. 13, 14). A central tegular process, which lies behind the median apophysis, is sub-triangular in *T. europaea* (Fig. 3) and rounded in *T. marxii* (Fig. 4). Also, the body dimensions of *T. europaea* are one-third smaller than those of *T. marxii*: *T. europaea* ( $n = 10$ ): total length  $4.75 \pm 0.28$  mm; carapace length  $2.5 \pm 0.16$  mm; carapace width  $1.6 \pm 0.1$  mm; and *T. marxii* (taken from Dondale & Redner 1981) ( $n = 20$ ): total length 6.25 mm; carapace length  $3.4 \pm 0.32$  mm; carapace width  $1.6 \pm 0.1$  mm.

**Description.**—*Male*: Carapace dark orange. Three light-colored stripes in median line, fovea line and the line of posterior lateral eyes; the light median line is found along the entire carapace in some specimens, while the two lateral light stripes are limited to the pars cephalica. Fovea, radial stripes and carapaceal margin dark brown. Eye field slightly darker than remainder of carapace. PME row wider than frontal eye row. AME slightly larger than ALE.

**Chelicerae:** with 3 prolateral and 2 retrolateral teeth; color yellow-brownish, similar to color of sternum and leg coxae.

**Abdomen:** brown, bearing a lanceolate mark on anterior half of dorsum; blurred light-colored small spots form a pattern towards end of abdomen; posterior third of abdomen with a few darker transversal spots; ventral side lighter than dorsal side; color yellow-brownish, without any spots; spinnerets slightly darker than ventral side of abdomen; lighter color of ventral side continues upwards on side of abdomen and when viewed from above, forming a frame around dorsal pattern.

**Legs:** uniformly yellow orange. Setae ( $n = 10$ ): femur I: dorsal 3, prolateral 0–1, retrolateral 0; tibia I: dorsal 0–1, prolateral 1–2, retrolateral 2, ventral 2p; basitarsus I: dorsal 0, prolateral 1–2, retrolateral 0–2, ventral 2p.



Figures 9, 10.—Scanning micrographs of the male palp, ventral view, of *Trebacosa* species: 9. *T. europaea*; 10. *T. marxi*.

Palp: median apophysis (Figs. 1, 9, 11) very large, 1.7 times longer than wide, and with two large pointed processes, each subequal in size (Figs 7, 11); upper process bent out only slightly towards terminal apophysis, and bent apically almost perpendicular to main axis of median apophysis (Figs. 1, 9); upper branch of terminal apophysis clearly bent basally (Fig. 13); central tegular process, which lies behind the median apophysis, subtriangular (Fig. 3); embolus long and slender, terminating near terminal apophysis; cymbium yellow orange; hairs not modified.

Somatic features ( $n = 10$ ): total length:  $4.75 \pm 0.28$  mm; carapace length:  $2.5 \pm 0.16$  mm, carapace width:  $1.6 \pm 0.1$  mm.

*Female*: Unknown.

**Distribution.**—Hungary.

**Natural history.**—The typical habitats of *T. marxi* are swamps, marshes, sphagnum bogs, and wet leaf litter (Dondale & Redner 1981), and our data demonstrate that *T. europaea* occurs in similar wetland habitats. The two previous reports of *Trebacosa* in Europe also mentioned similar habitats (Villepoux 1995; Zhukovets 2003). Specimens of *T. eu-*

*ropaea* were collected in a reed bed on the southern shore of Lake Velencei. The dominant species of the shoreline association (*Phragmitetum communis*) is *Phragmites australis*. Further species include *Typha angustifolia*, *Eupatorium cannabinum*, *Calystegia sepium*, *Solanum dulcamara*, *Echinocystis lobata*, *Lycopus europaeus* and *Mentha arvensis*. The specimens were captured 5–15 m from the open water surface. The soil water in this zone is very close (2–5 cm) to the soil surface and the decaying plant material and mosses are continuously soaked with water.

We collected and identified 3,922 specimens of 89 ground-dwelling spider species from reed beds between November 2003 and June 2005. Several species were found that are rare, habitat specialist spiders of European reed beds, indicating the natural value of the area. Some interesting spider species that co-occurred with *Trebacosa europaea* included: *Ero cambridgei* (Kulczyński 1911); *Crustulina sticta* (O. Pickard-Cambridge 1861); *Aracooncus crassipes* (Westring 1861); *Entelecara omissa* (O. Pickard-Cambridge 1902); *Glyphesis servulus* (Simon 1881); *G. taople-*



Figures 11–14.—Scanning micrographs of apophyses in male palps of *Trebacosa* species: 11. Median apophysis of *T. europaea*, lateral view; 12. Median apophysis of *T. marxi*, lateral view; 13. Terminal apophysis of *T. europaea*, lateral view; 14. Terminal apophysis of *T. marxi*, lateral view.

*sus* Wunderlich 1969; *Pelecopsis mendei* (Simon 1884); *Walckenaeria unicornis* (O. Pickard-Cambridge 1861); *Pirata tenuitarsis* (Simon 1876); and *Argyroneta aquatica* (Clerck 1757).

The majority of the dominant spider species were tolerant, commonly occurring, ground-dwelling species: *Alopecosa pulverulenta* (Clerck 1757); *Pardosa prativaga* (L. Koch 1870); *Trochosa ruricola* (De Geer 1778); *Antistea elegans* (Blackwall 1841); *Agracina striata* (Kulczyński 1882); *Drassyllus lutitanus* (L. Koch, 1866); *Trachyzelotes pedestris* (C.L. Koch 1837). Rare orb-weaver species,

such as *Larinia elegans* Spassky 1939 and *L. bonneti* Spassky 1939 were also found (Szinétár & Eichardt 2004). The male specimens of *T. europaea* were collected from May to July, which is likely to represent the main activity period of both sexes. However, we do not have data on females.

**Biogeography.**—The discovery of European species of *Trebacosa* (Villepoux 1995; Zhukovets 2003) has shown that the genus is present in both the Nearctic and Palearctic regions and, if all European populations are eventually found to be conspecific, *T. marxi* in North America and *T. europaea* in Europe

may be postulated as sister species. Formation of the genus presumably took place by the end of the Lower Eocene when North America had direct land connection with Europe via Greenland and Scandinavia (Cox et al. 1973).

The discovery of a previously unnamed, medium-sized spider in central Europe is surprising, especially as *T. marxii* was first described over 100 years ago, but the highly specialized habitat in which *T. europaea* was found has been less intensively studied than other terrestrial habitats in Europe. This claim is also supported by recent discoveries of several water-bound species from Central Europe (e.g., Uhl et al. 1992; Szinetár & Eichardt 2004).

#### ACKNOWLEDGMENTS

The authors are grateful to Dr. C.D. Dondale for donating *T. marxii* specimens, to Nadine Dupérré for her assistance in acquiring literature. We are grateful to Krisztina Buczkó and Tamás Szűts for their help with the scanning micrographs. The authors wish to thank Mr. Péter Ujhelyi, Warden of the Chernel István Bird Observatory, to Mr. Ferenc Falussy, Director of the Inspectorate of Lake Velencei, and to the Directorate of the Duna-Ipoly National Park for their kind permission to carry out the survey. Csaba Szinetár was supported by a Bolyai Fellowship of the Hungarian Academy of Sciences. Sz. Lengyel improved the English text. Special thanks to two referees for their critical reviews of a draft of this paper.

#### LITERATURE CITED

- Cox, C.B., I.N. Healey & P.D. Moore. 1973. Biogeography: An Ecological and Evolutionary Approach. Blackwell Scientific Publications, Oxford, UK. 179 pp.
- Dondale, C.D. & J.H. Redner. 1981. Classification of two North American species of *Pirata*, with a description of a new genus (Araneae, Lycosidae). Bulletin of the American Museum of Natural History 170:106–110.
- Paquin, P. & N. Dupérré. 2003. Guide d'identification des Araignées (Araneae) du Québec. Fabriques, Supplément II. 251 pp.
- Szinetár Cs. & J. Eichardt. 2004. *Larvinia* species (Araneidae, Araneae) in Hungary. Morphology, phenology and habitats of *Larvinia jeskovi* Marcusik, 1986, *Larvinia elegans* Spassky, 1939, and *Larvinia bonnetii* Spassky, 1939. Pp. 179–186. In European Arachnology 2002. (F. Samu & Cs. Szinetár, eds.). Akaprint Kft., Budapest, Hungary.
- Uhl, G., P. Sacher, I. Weiss & O. Kraus. 1992. Europäische Vorkommen von *Tetragnatha shoshonae* (Arachnida, Araneae, Tetragnathidae). Verhandlungen des Naturwissenschaftlichen Vereins in Hamburg 33:247–261.
- Villepoux, O. 1995. A spider from genus *Trebacosa* (Lycosidae). P. 236. In Proceedings of the 15<sup>th</sup> European Colloquium of Arachnology, Abstracts (V. Ruzicka, ed.). Institute of Entomology, Česká Budějovice, Czech Republic.
- Zhukovets, E.M. 2003. A new species of the genus *Trebacosa* Dondale & Redner, 1981 from the Republic of Belarus (Araneae: Lycosidae). P. 95. In 21<sup>st</sup> European Colloquium of Arachnology, Abstracts (V.E. Kipyatkov, ed.). St. Petersburg University Press, St. Petersburg, Russia.

*Manuscript received 5 May 2006, revised 13 July 2006.*